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EXAMINER

ZHU, BO HUI ALVIN

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/722,180  
Filing Date: November 24, 2003  
Appellant(s): MEHRA, PANKAJ

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Guy K. Clinger  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed on 05/01/2008 appealing from the Office action mailed on 03/11/2008.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct. However, upon review of Appellant Brief, the 102(b) rejections of claims 12, 30 and 42 have been withdrawn. Claims 12, 30 and 42 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

#### **(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct. It should be noted however that the 102(b) rejections of claims 12, 30 and 42 have been withdrawn. Claims 12, 30 and 42 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

#### **(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

#### **(8) Evidence Relied Upon**

No evidence is relied upon by the examiner in the rejection of the claims under appeal.

#### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

##### ***Claim Rejections - 35 USC § 102***

1. Claims 1 – 7, 11, 13, 14, 16 – 21, 29, 31 – 37, 41 and 43 are rejected under 35 U.S.C. 102(b) as being anticipated by Baty et al. (US 5,243,704).

(1) with regard to claims 1, 16 and 32:

Baty et al. discloses a system and method, comprising: a plurality of first nodes (12, 14, 16, 18, 20, 22 and 24 on Fig. 1) interconnected as a balanced incomplete block

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design of the form  $2-(v, k, 1)=b$ , wherein  $v$  first nodes ( $v = 7$ ), arranged in 7 groups of 3 first interconnected nodes ( $b = 7$  and  $k = 3$ ), the first nodes are interconnected such that each pair of first nodes appears in only one group of the  $b$  groups; and a plurality of first forwarding nodes (26, 28, 30, 32, 34, 36 and 38 on Fig. 1) configured to interconnect the plurality of first nodes; a plurality of sets of second nodes (12a, 12b and 12c of node 12 is a set of second nodes; 14a, 14b and 14c of node 14 is another set of second nodes; same for nodes 16, 18, 20, 22 and 24) wherein each second node is connected to one of the first nodes (e.g. 12a is connected to 12), and wherein each of the second nodes is interconnected to every other second node (e.g. 12a is connected to every other second nodes by 26, 28 – 38 and each interface section inside each node, e.g. 40 on 12).

(2) With regard to claims 2, 17 and 33:

Baty et al. further discloses each second node is interconnected to other second nodes via at least one first node (because every second node is on a first node, e.g. 12a on 12, 14a on 14, each second node is interconnected to every other second node via at least one of the first node).

(3) With regard to claims 3, 4, 18, 19, 34 and 35:

Baty et al. further discloses that each first node includes at least one first switch (40, 42, 44 and 46a – 46c on Fig. 1); and each second node in said plurality of sets of second nodes is interconnected to other second nodes via said at least one first switch (column 5, lines 12 – 31).

(4) With regard to claims 5, 6, 20 and 36:

Baty et al. further discloses each of said plurality of sets of second nodes is interconnected to another of said plurality of sets of second nodes via said at least one first switch; and said at least one first switch interconnects one of said plurality of sets of second nodes to another of said plurality of sets of second nodes (column 5, lines 12 – 31).

(5) With regard to claims 7, 21 and 37:

Baty et al. further disclose the at least one first switch is shared with at least two of said plurality of sets of second nodes (e.g. the switch in node 12 is shared with one set of 12a -12c and another set of 14a - 14c).

(6) With regard to claims 11, 29 and 41:

Baty et al. further discloses each second node in said plurality of sets of second nodes is configured with at least two communications ports (e.g. node 12a has two ports, one is connected to bus 26 and the other one is connected to a switching unit 42).

(7) With regard to claims 13 and 43:

Baty et al. further discloses at least one of said plurality of first forwarding nodes are chosen from a group consisting of routers, switches, crossbars, optical rings, backplanes, buses, interconnections, and links (column 4, lines 50 – 54).

(8) With regard to claims 14, 31:

Baty et al. further discloses that each second node in said plurality of sets of second nodes is interconnected to every other second node via at least one of said plurality of first nodes (because every second node is on a first node, e.g. 12a on 12,

14a on 14, each second node is interconnected to every other second node via at least one of the first node).

***Claim Rejections - 35 USC § 103***

2. Claims 8 – 10, 15, 22 – 28 and 38 – 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baty et al. (US 5,243,704) in view of Kim (US 5,892,932).

(1) With regard to claims 8, 22 and 38:

Baty et al. does not disclose that each of said plurality of sets of second nodes is further divided into a plurality of sub-sets of second nodes.

Kim teaches each of the plurality of sets of second nodes is further divided into a plurality of sub-sets of second nodes (Fig. 1, each switching apparatus has a plurality of interfaces). It would have been desirable to have a plurality of interfaces for each port of the system because it would improve the functionality of the system by providing more connection interfaces. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the teaching of Kim in the system of Baty et al.

(2) With regard to claims 9, 28 and 39:

Baty et al. does not disclose the plurality of sub-sets of second nodes in at least one of said plurality of sets of second nodes are interconnected to each other via a second switch.

Kim teaches the plurality of sub-sets of second nodes in at least one of said plurality of sets of second nodes are interconnected to each other via a second switch

(the interfaces are interconnected to each other via the time multiplex bus, Fig. 1). It would have been desirable having plurality of sub-sets of second nodes in at least one of said plurality of sets of second nodes interconnected to each other via a second switch because it would lead to more efficient usage of system resource by utilizing one switch to control the switching of all the interfaces. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the teaching of Kim in the system of Baty et al.

(3) With regard to claim 10:

Baty et al. discloses that the plurality of sub-sets of second nodes are interconnected to each other via at least one of said at least one first switches within one of said plurality of first nodes (e.g. the switch on node 12 interconnects nodes 12a, 12b and 12c, thus any connection between these nodes would be controlled by the switch).

(4) With regard to claim 23:

Baty et al. further discloses configuring a plurality of first forwarding nodes (26, 28, 30, 32, 34, 36 and 38 on Fig. 1) to interconnect the plurality of first nodes.

(5) With regard to claim 24:

Baty et al. further discloses at least one of said plurality of first forwarding nodes are chosen from a group consisting of routers, switches, crossbars, optical rings, backplanes, buses, interconnections, and links (column 4, lines 50 – 54).

(6) With regard to claims 15 and 25:



Baty et al. discloses that the plurality of sub-sets of second nodes are interconnected to each other via one of said plurality of first forwarding nodes (e.g. forwarding node 26 connects all the connections passing second node 12a).

(7) With regard to claim 26:

Baty et al. discloses that configuring a plurality of second forwarding nodes to interconnect the plurality of sets of second nodes (nodes 26, 28, 30 – 38 that are second forwarding nodes).

(8) With regard to claim 27:

Baty et al. further discloses at least one of said plurality of second forwarding nodes are chosen from a group consisting of routers, switches, crossbars, optical rings, backplanes, buses, interconnections, and links (column 4, lines 50 – 54).

(9) With regard to claim 40:

Baty et al. further discloses that each first node includes at least one switch (40, 42, 44 and 46a – 46c on Fig. 1).

3. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baty et al. (US 5,243,704).

(1) With regard to claim 44:

Baty et al. does not disclose the method is executed recursively. However, the Examiner takes Official Notice that the technique of recursion is well known in the art. Using recursion or recursive method would be desirable because it would allow an infinite set of possible designs to be defined or produced by a finite method or program, thus make the process of design more efficient. Therefore, it would have been obvious

to one of ordinary skill in the art at the time of the invention to use recursion in the method as taught by Baty et al.

#### **(10) Response to Argument**

4. ***Regarding claim 1 (pages 10 – 12 of the Appeal Brief), claim 16 (on page 17 of the Appeal Brief), and claim 32 (pages 24 – 25 of the Appeal Brief)***, Appellant argues that Baty does not disclose the first nodes, second nodes and forwarding nodes as claimed in claim 1; and that the Examiner fails to identify the groups or the group members or how each pair of Baty's seven first nodes would appear in only one of the seven groups and the multiple fabrics in the claimed multi-fabric system. Examiner respectfully disagrees. Baty discloses a multi-fabric interconnection system 10 (on Fig. 1, system 10 comprises a multi-fabric interconnection consisting of fabrics e.g. 26, 28, 30, 32, 34, 36 and 38). System 10, which also provides a method for achieving the functionality of system 10, comprises a plurality of first nodes (12, 14, 16, 18, 20, 22 and 24) interconnected in a mathematical form of a balanced incomplete block design defined as  $2 - (v, k, 1) = b$  with  $v = 7$ ,  $b = 7$  and  $k = 3$ ; a plurality of first forwarding nodes (26, 28, 30, 32, 34, 36 and 38) configured to interconnect the plurality of first nodes (12, 14, 16, 18, 20, 22 and 24); a plurality of sets of second nodes (12a, 12b and 12c of node 12 is a set of second nodes; 14a, 14b and 14c of node 14 is another set of second nodes; same for nodes 16, 18, 20, 22 and 24) wherein each second node is connected to one of the first nodes (e.g. 12a is connected to 12), and wherein each of the second nodes is interconnected to every other second node (e.g. 12a is connected to every

other second nodes by 26, 28 – 38 and each interface section inside each node, e.g. 40 on 12). Appellant further contends that the Examiner's interpretation for the term "node" leaves the term with practically no meaning at all. The Examiner respectfully disagrees. Baty's nodes (e.g. 12) correspond with the claimed "first nodes". Baty's buses (e.g. 26) correspond with the claimed "first forwarding nodes" because they are a form of buses, interconnections or links. Appellant argues that the term node is not used by the Appellant to refer to a bus or a port as in the cited portions of Baty. However, in claim 24, Appellant indicates the term node can refer to buses, interconnections, and links (lines 24 – 27, page 35 of the Appeal Brief). Thus, Examiner's broad interpretation of the term "node" is no different from Appellant's own interpretation of the term. Baty's nodes (e.g. 12a, 12b, 12c) correspond with the "second nodes" because they are connected to one of the first node (e.g. 12) and are interconnected to every other second node (see Fig. 1). As can be easily seen from Fig. 1, each pair of Baty's first nodes appear in only one of the groups, e.g. node 12 and node 14 appear in only the group of nodes interconnected by bus 26; node 14 and node 18 appear in only the group of nodes interconnected by bus 32.

5. ***Regarding claim 3 (on page 12 – 13 of the Appeal Brief), claim 18 (on page 19 of the Appeal Brief) and claim 34 (page 25 of the Appeal Brief)***, Appellant argues that Baty fails to disclose each first node includes at least one switch. The Examiner respectfully disagrees. As disclosed in column 5, lines 12 – 31, Baty teaches during data transmission, interface circuitry 40 and its processing logic section 42 within each

first node determines through which port data should be routed to a destination, and routing data from one port to another is the operation of a switch.

6. ***Regarding claim 4 (On page 13 of the Appeal Brief), claim 19 (on pages 20 of the Appeal Brief) and claim 35 (page 26 of the Appeal Brief)***, Appellant argues that Baty does not disclose each second node is interconnected to other second nodes via the first switch. Examiner respectfully disagrees. Baty's second nodes are interconnected to one another via the first switch, e.g. node (12a) is interconnected to node (12b) and node (12c) via switch (40 and 42).

7. ***Regarding claim 5 (on page 14 of the Appeal Brief), claim 6 (on page 15 – 16 of the Appeal Brief), claim 20 (pages 21 – 22 of the Appeal Brief) and claim 36 (page 27 of the Appeal Brief)***, Appellant argues that Baty fails to disclose each of the set of second node is interconnected to another set of second node via at least one first switch. Examiner respectfully disagrees. Baty teaches this feature and it can be seen from Fig. 1, e.g. the set of second node (12a - 12c) is interconnected to the set of second node (14a – 14c) via the first switch (40 and 42) since the first switch (40 and 42) determines how to route data from the first set of second node (12a - 12c) to the second set (14a - 14c).

8. ***Regarding claim 7 (page 16 – 17 of the Appeal Brief), claim 21 (page 22 of the Appeal Brief) and claim 37 (page 28 of the Appeal Brief)***, Appellant argues that Baty does not disclose at least one first switch is shared with at least two of the sets of second nodes. Examiner respectfully disagrees. Baty disclose this feature and it can be seen from Fig. 1, e.g. the first switch (40 and 42) is shared with two sets of second

nodes (12a – 12c) and (14a—14c). The Examiner's interpretation of the limitation "a switch is shared with two sets of second nodes" is no different than that of the Appellant's. As Appellant's "sharing" is used to refer to an indirect kind of sharing (see page 5 of the Appeal Brief, Appellant states that the first switch (240 on Fig. 14) is shared with a first set of second nodes (230 – 236, which is directly connected to switch 240) and a second set of second nodes (second nodes connected to V2 192, which is indirectly connected to the switch 240)). Thus, Appellant's interpretation of a switch being shared with two sets of second node is that the switch can be used by second nodes that are directly connected to it and also second nodes that are indirectly connected to it, which is the same as the Examiner's interpretation.

9. ***Regarding claim 11 (page 17 of the Appeal Brief), claim 29 (page 23 of the Appeal Brief) and claim 41 (pages 28 – 29 of the Appeal Brief)***, Appellant argues that the Examiner's interpretation of the term "second node" is improper. Examiner respectfully disagrees. As discussed above, Baty's nodes (e.g. 12a, 12b, 12c, 14a, 14b, 14c) correspond with the claimed "second nodes" because each of these node has at least two communication ports, e.g. node 12a has two communication ports, i.e. one is connected to trace 46a and another one is connected to bus 26.

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**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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